

Preliminary Classification:

Proposed Class:

Subclass:

NOTE: "All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example 'Proposed Class 2, subclass 129.'" M.P.E.P. § 601, 7th ed.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application
Assistant Commissioner for Patents
Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of

Inventor(s): Sami INKINEN, Simo VAPAAKOSKI

WARNING: 37 C.F.R. § 1.41(a)(1) points out:

"(a) A patent is applied for in the name or names of the actual inventor or inventors.

"(1) The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.63, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(i) is filed supplying or changing the name or names of the inventor or inventors."

For (title): A METHOD FOR DATA COMMUNICATION BETWEEN A WIRELESS DEVICE AND AN
ELECTRONIC DEVICE, AND A DATA COMMUNICATION DEVICE

CERTIFICATION UNDER 37 C.F.R. § 1.10*

(Express Mail label number is mandatory.)

(Express Mail certification is optional.)

I hereby certify that this New Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date October 28, 1999, in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EL067143071US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Shauna Murphy

(type or print name of person mailing paper)



Signature of person mailing paper

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. § 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. § 1.10(b).

"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will not be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

(New Application Transmittal [4-1]—page 1 of 11)

Jc503 U.S. PTO

09/428813

10/28/99

1. Type of Application

This new application is for a(n)

(check one applicable item below)

☒ Original (nonprovisional)

☐ Design

☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. § 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

WARNING: Do not use this transmittal for the filing of a provisional application.

NOTE: If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

☐ Divisional.

☐ Continuation.

☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. §§ 119(e), 120, or 121)

NOTE: A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or copending international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or copending international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. § 112. Each prior application must also be:

(i) An international application entitled to a filing date in accordance with PCT Article 11 and designating the United States of America; or

(ii) Complete as set forth in § 1.51(b); or

(iii) Entitled to a filing date as set forth in § 1.53(b) or § 1.53(d) and include the basic filing fee set forth in § 1.16; or

(iv) Entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(f) within the time period set forth in § 1.53(f).

37 C.F.R. § 1.78(a)(1).

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. §§ 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. §§ 120, 121 or 365(c). (35 U.S.C. § 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. §§ 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

(New Application Transmittal [4-1]—page 2 of 11)

WARNING: When the last day of pendency of a provisional application falls on a Saturday, Sunday, or Federal holiday within the District of Columbia, any nonprovisional application claiming benefit of the provisional application must be filed prior to the Saturday, Sunday, or Federal holiday within the District of Columbia. See 37 C.F.R. § 1.78(a)(3).

- ☐ The new application being transmitted claims the benefit of prior U.S. application(s). Enclosed are ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

3. Papers Enclosed

A. Required for filing date under 37 C.F.R. § 1.53(b) (Regular) or 37 C.F.R. § 1.153 (Design) Application

7 Pages of specification

2 Pages of claims

4 Sheets of drawing

WARNING: DO NOT submit original drawings. A high quality copy of the drawings should be supplied when filing a patent application. The drawings that are submitted to the Office must be on strong, white, smooth, and non-shiny paper and meet the standards according to § 1.84. If corrections to the drawings are necessary, they should be made to the original drawing and a high-quality copy of the corrected original drawing then submitted to the Office. Only one copy is required or desired. For comments on proposed then-new 37 C.F.R. § 1.84, see Notice of March 9, 1988 (1990 O.G. 57-62).

NOTE: "Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawing a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page . . ." 37 C.F.R. § 1.84(c)).

(complete the following, if applicable)

- ☐ The enclosed drawing(s) are photograph(s), and there is also attached a "PETITION TO ACCEPT PHOTOGRAPH(S) AS DRAWING(S)." 37 C.F.R. § 1.84(b).

☐ formal

☐ Informal

B. Other Papers Enclosed

6 Pages of declaration and power of attorney

1 Pages of abstract

 Other

4. Additional papers enclosed

- ☐ Amendment to claims

☐ Cancel in this applications claims _____ before calculating the filing fee. (At least one original independent claim must be retained for filing purposes.)

☐ Add the claims shown on the attached amendment. (Claims added have been numbered consecutively following the highest numbered original claims.)

☐ Preliminary Amendment

☐ Information Disclosure Statement (37 C.F.R. § 1.98)

☐ Form PTO-1449 (PTO/SB/08A and 08B)

☐ Citations

- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

5. Declaration or oath (including power of attorney)

NOTE: A newly executed declaration is not required in a continuation or divisional application provided that the prior nonprovisional application contained a declaration as required, the application being filed is by all or fewer than all the inventors named in the prior application, there is no new matter in the application being filed, and a copy of the executed declaration filed in the prior application (showing the signature or an indication thereon that it was signed) is submitted. The copy must be accompanied by a statement requesting deletion of the names of person(s) who are not inventors of the application being filed. If the declaration in the prior application was filed under § 1.47, then a copy of that declaration must be filed accompanied by a copy of the decision granting § 1.47 status or, if a nonsigning person under § 1.47 has subsequently joined in a prior application, then a copy of the subsequently executed declaration must be filed. See 37 C.F.R. §§ 1.63(d)(1)-(3).

NOTE: A declaration filed to complete an application must be executed, identify the specification to which it is directed, identify each inventor by full name including family name and at least one given name, without abbreviation together with any other given name or initial, and the residence, post office address and country or citizenship of each inventor, and state whether the inventor is a sole or joint inventor. 37 C.F.R. § 1.63(a)(1)-(4).

- ☐ Enclosed

Executed by

(check all applicable boxes)

- ☐ inventor(s).
- ☐ legal representative of inventor(s).
37 C.F.R. §§ 1.42 or 1.43.
- ☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.
 - ☐ This is the petition required by 37 C.F.R. § 1.47 and the statement required by 37 C.F.R. § 1.47 is also attached. See item 13 below for fee.

- ☒ Not Enclosed.

NOTE: Where the filing is a completion in the U.S. of an International Application or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

- ☒ Application is made by a person authorized under 37 C.F.R. § 1.41(c) on behalf of all the above named inventor(s).

(The declaration or oath, along with the surcharge required by 37 C.F.R. § 1.16(e) can be filed subsequently).

- ☐ Showing that the filing is authorized.
(not required unless called into question. 37 C.F.R. § 1.41(d))

6. Inventorship Statement

WARNING: If the named inventors are each not the inventors of all the claims an explanation, including the ownership of the various claims at the time the last claimed invention was made, should be submitted.

The inventorship for all the claims in this application are:

☐ The same.

or

☐ Not the same. An explanation, including the ownership of the various claims at the time the last claimed invention was made,

☐ is submitted.

☐ will be submitted.

7. Language

NOTE: An application including a signed oath or declaration may be filed in a language other than English. An English translation of the non-English language application and the processing fee of \$130.00 required by 37 C.F.R. § 1.17(k) is required to be filed with the application, or within such time as may be set by the Office. 37 C.F.R. § 1.52(d).

☒ English

☐ Non-English

☐ The attached translation includes a statement that the translation is accurate. 37 C.F.R. § 1.52(d).

8. Assignment

☒ An assignment of the invention to Nokia Mobile Phones Ltd.

☒ is attached. A separate ☒ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

☐ will follow.

NOTE: "If an assignment is submitted with a new application, send two separate letters—one for the application and one for the assignment." Notice of May 4, 1990 (1114 O.G. 77-78).

WARNING: A newly executed "CERTIFICATE UNDER 37 C.F.R. § 3.73(b)" must be filed when a continuation-in-part application is filed by an assignee. Notice of April 30, 1993, 1150 O.G. 62-64.

(New Application Transmittal [4-1]—page 5 of 11)

9. Certified Copy

Certified copy(ies) of application(s)

Country	Appln. No.	Filed
Finland	982353	29 October 1998
Country	Appln. No.	Filed
Country	Appln. No.	Filed

from which priority is claimed

☒ is (are) attached.

☐ will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 C.F.R. § 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. § 120 is itself entitled to priority from a prior foreign application, then complete Item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 C.F.R. § 1.16)

A. ☒ Regular application

CLAIMS AS FILED						
Number filed			Number Extra	Rate		Basic Fee 37 C.F.R. § 1.16(a) \$760.00
Total						
Claims (37 C.F.R. § 1.16(c))	12	- 20 =	0	×	\$ 18.00	0
Independent						
Claims (37 C.F.R. § 1.16(b))	2	- 3 =	0	×	\$ 78.00	0
Multiple dependent claim(s),						
If any (37 C.F.R. § 1.16(d))				+	\$260.00	

☐ Amendment cancelling extra claims is enclosed.

☐ Amendment deleting multiple-dependencies is enclosed.

☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 C.F.R. § 1.16(d).

Filing Fee Calculation \$ 760.00

B. ☐ Design application
(\$310.00—37 C.F.R. § 1.16(f))

Filing Fee Calculation \$

C. ☐ Plant application
(\$480.00—37 C.F.R. § 1.16(g))

Filing fee calculation \$

11. Small Entity Statement(s)

- ☐ Statement(s) that this is a filing by a small entity under 37 C.F.R. § 1.9 and 1.27 is (are) attached.

WARNING: "Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. The refiling of an application under § 1.53 as a continuation, division, or continuation-in-part (including a continued prosecution application under § 1.53(d)), or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the continuing or reissue application. A nonprovisional application claiming benefit under 35 U.S.C. § 119(e), 120, 121, or 365(c) of a prior application, or a reissue application may rely on a statement filed in the prior application or in the patent if the nonprovisional application or the reissue application includes a reference to the statement in the prior application or in the patent or includes a copy of the statement in the prior application or in the patent and status as a small entity is still proper and desired. The payment of the small entity basic statutory filing fee will be treated as such a reference for purposes of this section." 37 C.F.R. § 1.28(a)(2).

WARNING: "Small entity status must not be established when the person or persons signing the . . . statement can unequivocally make the required self-certification." M.P.E.P., § 509.03, 6th ed., rev. 2, July 1996 (emphasis added).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application _____ / _____, filed on _____, from which benefit is being claimed for this application under:

35 U.S.C. § ☐ 119(e),
☐ 120,
☐ 121,
☐ 365(c),

and which status as a small entity is still proper and desired.

- ☐ A copy of the statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above)

\$ _____

NOTE: Any excess of the full fee paid will be refunded if small entity status is established and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136. 37 C.F.R. § 1.28(a).

12. Request for International-Type Search (37 C.F.R. § 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 C.F.R. § 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Filing fee \$ 760.00

☒ Recording assignment
(\$40.00; 37 C.F.R. § 1.21(h))
(See attached "COVER SHEET FOR
ASSIGNMENT ACCOMPANYING NEW
APPLICATION".) \$ 40.00

☐ Petition fee for filing by other than all the
inventors or person on behalf of the inventor
where inventor refused to sign or cannot be
reached
(\$130.00; 37 C.F.R. §§ 1.47 and 1.17(l)) \$ _____

☐ For processing an application with a
specification in
a non-English language
(\$130.00; 37 C.F.R. §§ 1.52(d) and 1.17(k)) \$ _____

☐ Processing and retention fee
(\$130.00; 37 C.F.R. §§ 1.53(d) and 1.21(l)) \$ _____

☐ Fee for international-type search report
(\$40.00; 37 C.F.R. § 1.21(e)) \$ _____

NOTE: 37 C.F.R. § 1.21(f) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 C.F.R. § 1.53(f) and this, as well as the changes to 37 C.F.R. §§ 1.53 and 1.78(a)(1), indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(f) must be paid, within 1 year from notification under § 53(f).

Total fees enclosed \$ 800.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 800.00

☐ Charge Account No. _____ in the amount of
\$ _____

A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 C.F.R. § 1.22(b).

15. Authorization to Charge Additional Fees

WARNING: If no fees are to be paid on filing, the following items should not be completed.

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

- ☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 16-1350:

☒ 37 C.F.R. § 1.16(a), (f) or (g) (filing fees)

☒ 37 C.F.R. § 1.16(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.16(d)), it might be best not to authorize the PTO to charge additional claim fees, except possibly when dealing with amendments after final action.

☒ 37 C.F.R. § 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☒ 37 C.F.R. § 1.17(a)(1)–(5) (extension fees pursuant to § 1.136(a)).

☐ 37 C.F.R. § 1.17 (application processing fees)

NOTE: ". . . A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. § 1.28(b) requires "Notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . the issue fee. . . ." From the wording of 37 C.F.R. § 1.28(b), (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

16. Instructions as to Overpayment

NOTE: "... Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

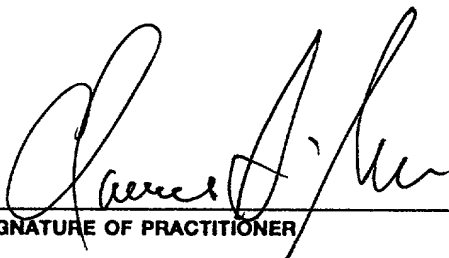
- ☒ Credit Account No. 16-1350
☐ Refund

SEND ALL CORRESPONDENCE TO:

Reg. No. 24,622

Tel. No. (203) 259-1800

Customer No.



SIGNATURE OF PRACTITIONER
Clarence A. Green

(type or print name of attorney)
PERMAN & GREEN, LLP

P.O. Address
425 Post Road, Fairfield, Connecticut 06430

☐ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added _____

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added _____

- ☐ Plus added pages deleting names of inventor(s) named in prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added _____

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added _____

☒ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)

- ☒ This transmittal ends with this page.

A method for data communication between a wireless device and an electronic device, and a data communication device

The object of the invention is an advantageous way to connect electronics equipment for instance to a mobile station via a standardised interface for short-range wireless data communication, and a data communication device connected to this standardised interface.

- 5 It is previously known to connect a portable computer and a mobile station 1 via an infrared (IR) link to a printer 4 shown in figure 1. Then an IR transmitter/receiver 2, 3 is constructed in the devices 1, 4 being parties of the data communication, and routines required by the data communication has been designed in the software of the devices 1, 4.
- 10 There are also known mobile communications applications developed particularly in connection with portable data processing equipment, such as laptop PCs. In these applications at least the transmitter/receiver functions of the mobile station are realised in a PC Card. A PC Card is an expansion card with an interface to the electronic device, such as a computer, which interface is defined by the PCMCIA standard (Personal Computer Memory Card International Association). For instance an
- 15 expansion card containing a transmitter/receiver of a GSM mobile station is used for data communication in order to connect the electronic device to the GSM network. However, the use of the application requires pre-installed software in the electronic device.
- 20 There is also known a low power radio frequency (LPRF) or a short-range radio frequency link, which replaces a connection cable between electronic devices, and which is defined at least by the Bluetooth Special Interest Group. This concerns an unfinished industry standard where the communication link is intended to be realised at a vacant ISM frequency (Industrial, Scientific, Medical) of 2,45 GHz and at a
- 25 power of 0 dBm or 1 mW, whereby the range is 10 meters and the data transmission rate is 721 kbit/s. The link uses frequency hopping and a time divided duplex connection. Reference: Codename Bluetooth, A Global Specification for Wireless Connectivity, Bluetooth Special Interest Group, www.bluetooth.com, 1988.
- 30 It is also known to expand the features of mobile stations with the aid of expansion cards. Then for instance a digital camera is connected to the mobile station.

A problem in known devices is that they require identification of the expansion card and co-operation in the electronic device. An electronic device connecting a mobile station to a cellular radio network requires special software for the data communication link and a sufficient processor capacity.

- 5 The object of the invention is to present a new method for realising the data communication between electronic devices and a wireless device, and a data communication device which can be connected to a general purpose expansion card interface. The data communication device is particularly suited for electronic devices having insufficient processor capacity for the functions required by a data communication
10 network. Further the use of the data communication device does not require preparations in the device to be connected, such as particular software for the data communication.

- The invention relates to a method for wireless data communication between a wireless device, which comprises means for short-range data communication, and an
15 electronic device. According to the invention the method comprises the following method steps:

- in the general purpose expansion memory location of the electronic device there is mounted a data communication device having means for short-range wireless data communication;
- 20 - the short-range wireless data communication link between the wireless device and the data communication device is activated; and
- data is transmitted between the data communication device and the wireless device.

- The invention relates also to a data communication device for wireless data communication between a wireless device, which has means for a short-range data link, and an electronic device. According to the invention the data communication device comprises
25

- a controller, which can be connected to the general purpose interface of an expansion memory location of the electronic device for controlling the operation of the data communication device,
- 30 - a short-range wireless data communication unit and an antenna for data communication; and
- a memory for storing the communicated data.

- According to the invention there is used a particular memory card, which is mounted
35 in a general purpose expansion memory location of a separate electronic device,

such as a digital camera, and which contains a data communication feature for transmitting the memory contents to a wireless device. A general purpose expansion memory location of this kind is defined for instance in the ATA (Attachment Interface) specification. Expansion cards containing memory which can be written and read are called Compact Flash, in accordance with the small-sized cards generally containing Flash EEPROM memory. The data communication utilises for instance a short-range radio frequency LPRF link. The memory card is also suitable for instance for a personal digital assistant (PDA), where the entered data can be stored in the expansion memory. Due to the duplex characteristic of the expansion memory the data can be also transmitted at a radio frequency to a wireless device, or generally to an LPRF device. The data communication characteristics of the wireless device are available for transmitting the data forward.

A data communication device according to the invention is based on the use of a virtual duplex memory. The data communication device comprises memory, a short-range radio frequency link unit, and control logic. The memory is for instance Flash memory, RAM (Random Access Memory) or RAM memory with battery back-up. Regarding the operation of the electronic device the data communication device is used as ordinary expansion memory, but the data can be read and written also by an external device, such as by a mobile station using a short-range radio frequency link. The data communication is most preferably started automatically so that it is triggered by the storing of new data, but transmission is also possible so that it is activated by an external device.

The data communication according to the invention is suitable particularly for the transmission of digital pictures between a mobile station, such as a communicator or a smart phone, and a digital camera, but also for the transmission of data, such as the contents of a calendar, between a personal digital notebook or a portable computer and a mobile station.

An advantage of the invention is that the data communication device fits in a general purpose expansion memory location, whereby the electronic device, such as a camera, requires no hardware changes and also no software changes for the data communication. A general purpose expansion memory location is common in digital cameras, but the I/O ports (Input/Output) actually intended for data communication are not. Thus the method according to the invention enables the transmission of pictures to a separate device also from a camera which does not contain facilities for the transmission of pictures.

Another advantage of the invention is the wireless data communication in connection with a device having a processor capacity which is insufficient in order to realise the functions required for wireless data communication.

5 A further advantage of the invention is the extra memory which the data communication device provides to the electronic device in addition to the data communication characteristics.

Advantageous embodiments of the invention are presented in the dependent claims.

The invention is described in detail below with reference to the enclosed drawing, in which

10 Figure 1 shows a known arrangement for data communication between a mobile station and an electronic device;

Figure 2 shows an arrangement according to the invention for data communication between a mobile station and an electronic device;

15 Figure 3 shows a flow diagram of a method according to the invention for data communication between a wireless device and an electronic device;

Figure 4 shows a block diagram of a data communication device according to the invention;

Figure 5 shows a block diagram of the controller of a data communication device according to the invention; and

20 Figure 6 shows essential parts in a wireless device according to the invention.

Figure 1 was discussed above in the section regarding prior art.

Figure 2 shows an arrangement according to the invention where we can see a mobile station 5 and a camera 10. A data communication device 8 is mounted in the camera's 10 general purpose expansion memory location 9 for the storing and
25 transmission of pictures. The wireless data communication between the wireless device 5 and the data communication unit 8 is made by a short-range radio link via the antennas 6, 7. The interface of the data communication device 8 to the camera 10 is for instance of the ATA type presented in the figure, and the short-range radio link is of the LPRF type.

Figure 3 shows in a flow diagram a method according to the invention for data communication between a wireless device and an electronic device. First a data communication device is mounted 11 in the electronic device. The installation is made by pushing a data communication device according to the invention into a
 5 general purpose expansion memory location of the electronic device. Regarding the electronic device the data communication device is to this end a common expansion memory card.

Data is input 12 to the electronic device. The input data is for instance a picture reflected as light through an objective, or a daily schedule created by the user. The
 10 data is processed 13 in the data communication device, for instance by storing the above input data into the data communication device mounted in the expansion memory location. The storing of data and any reading of data is made by particular instructions, such as ATA instructions. However, data input 12 or processing 13 is
 15 not performed if data is simultaneously transmitted by the wireless device to the electronic device.

The data communication link from the wireless device to the data communication device is activated 14. Data is transmitted 15 between the data communication device and the wireless device, most preferably automatically on the basis of the logic of the data communication device so that the transmission is activated when data is
 20 stored, whereby the data communication device has information about the receiving device, such as an address code, in order to perform the transmission. Alternatively the data is transmitted on the bases of instructions given by the wireless device. The data communication link from the wireless device to the data communication device is disconnected 16.

Figure 4 shows a block diagram of a data communication device 8 according to the invention. In the data communication device 8 there is seen a controller 17 connected to the general purpose expansion memory interface of the expansion memory location for controlling the operation of the data communication device, a short-range data communication link unit 18, such as a short range radio link LPRF unit,
 25 and an antenna 7 for the data communication, and a memory 19, such as a Flash memory or a RAM memory, for storing data. The LPRF unit contains for instance sections according to the Bluetooth industry standard, such as a radio unit, a link control and management unit, and software facilities. Other ways to realise the short-range link are for instance infrared (IR), acoustic ultrasonic data communication,
 30 and a wireless local area network (WLAN).

Figure 5 shows a more detailed block diagram of the controller 17 shown generally in figure 4, when the expansion memory interface is an ATA interface, and the short-range data communication link unit 18 is an LPRF unit. In the controller there is seen a microcontroller A, a serial to parallel converter B and a splitter C. The microcontroller A gives a busy signal BUSY to the electronic device when the memory 19 is processed by the radio link, and a signal ATA BUSY to the LPRF unit when the memory 19 is processed by the electronic device. Further there is given to the microcontroller a card operation enable (CE) signal A when the memory 19 is processed by the electronic device, and an LPRF BUSY signal when the LPRF unit 18 is occupied for data communication. To a man skilled in the art it obvious that in general a data communication device according to the invention comprises means for giving to the microcontroller an operation enable signal enabling the operation of the data communication device when the memory is processed by the electronic device, and a busy signal when the LPRF unit is occupied for data communication. The microcontroller A controls the series-parallel converter B and the splitter C. The serial to parallel converter B converts the memory's 19 parallel mode data into the serial mode used by the LPRF unit 18, and correspondingly it converts the serial mode into the parallel mode. The splitter C connects the memory's 19 parallel mode write and read connection alternatively to the ATA interface of the electronic device or to the serial to parallel converter B for the LPRF link.

Figure 6 shows a block diagram of such parts in a wireless device 5 according to the invention which are essential to the invention. In the mobile station 5 we can see a processor 21 for processing the normal operations and the data communication according to the invention, a memory 22 for storing the data of the data communication and the program, a display 23 for displaying program outputs, a keyboard 24 for using the data communication, an audio section 25 for speech facilities, a main transmitter/receiver 26 and an antenna 27 for normal traffic, and a short-range data communication transmitter/receiver 28 and antenna 29 for the data communication, such as LPRF, between the wireless device 5 and the data communication device 10. The LPRF transmitter/receiver contains for instance sections according to the Bluetooth industry standard, such as a radio unit, a link control unit, and a link management unit and program functions.

As an example let us examine the transmission of pictures from a common digital camera to a mobile station of the communicator type. The camera has a Compact Flash expansion memory location with an ATA interface of a general type, a data communication unit according to the invention attached to it, and the mobile station

has an LPRF interface. Pictures are taken with the camera and stored in the data communication unit in the same way as in a common expansion memory. The mobile station activates the LPRF communication link of the data communication unit and requests transmission of the stored data to the mobile station. The memory of the data communication unit is allocated to the LPRF link and the data transmission to the mobile station is started. However, no information is conveyed to the camera about the operation, because from the viewpoint of the camera the data communication unit is only an expansion memory. However, if the camera tries to process the expansion memory during the LPRF data transmission, this is not possible as it is prevented by a busy signal so that data can not be changed when another processes it. In this way consistent memory contents are maintained.

When the pictures have been transmitted to the mobile station the features and the capacity of the data communication network can be used to forward the pictures. Thanks to the LPRF link and the wireless device an electronic device such as a digital camera, has thus a world-wide range for the transmission of the pictures.

In this context an electronic device means some other device than a wireless device being one party in the data communication and having the means required by the short-range data communication link. Further a wireless device means most preferably a mobile station, but also any other device used for wireless data communication. A mobile station is particularly suitable due to the possible dual utilisation of the antenna and the radio frequency sections. The sections can be used both for normal traffic and for short-range data communication. Such mobile stations operating on two frequency bands are generally known in GSM systems.

As another example let us examine the transmission of the camera's pictures, in a manner according to the invention, to a common electronic device, such as a printer having the means required by the short-range data communication. Then the camera has a data communication unit according to the invention, and when a picture is stored in the camera it causes the transmission of the picture to another electronic device. Thus the contents of the expansion memory is kept the same at least in a unidirectional sense, and the camera pictures are available for instance to a printer, for instance for immediate printing.

The invention is not limited to relate only to the above presented embodiment examples, but many modifications are possible within the inventive idea defined by the claims.

Claims

1. A method for wireless data communication between a wireless device, which comprises means for short-range data communication, and an electronic device, **characterised** in that the method includes the following method steps:

- in a general purpose expansion memory location of the electronic device there is mounted a data communication device having means for short-range wireless data communication;
- a short-range wireless data communication link between the wireless device and the data communication device is activated; and
- data is transmitted between the data communication device and the wireless device.

2. A method according to claim 1, **characterised** in that in order to enable the data transmission from the electronic device to the wireless device the following method steps are performed after the installation of the data communication device and before the activation of the data communication link:

- data is input to the electronic device; and
- the data is processed in the data communication device installed in an expansion memory location.

3. A method according to claim 2, **characterised** in that the data processing in the data communication device is made by instructions from the electronic device.

4. A method according to claim 1, **characterised** in that the data communication between the data communication device and the wireless device is made over an LPRF link.

5. A method according to claim 1, **characterised** in that that the data communication between the data communication device and the wireless device is made on the basis of instructions given by the wireless device.

6. A method according to claim 1, **characterised** in that the data communication between the data communication device and the wireless device is made automatically on the basis of the logic of the data communication device so that it is activated by the storage of data.

7. A method according to claim 2, **characterised** in that the input data is a picture reflected as light through the objective of a camera.

8. A communications device for wireless data communication between a wireless device, which has means for a short-range data link, and an electronic device, **characterised** in that the data communication device comprises:

- a controller connectable to a general purpose interface of an expansion memory location of the electronic device, for controlling the operation of the data communication device,
- a short-range wireless data communication unit and an antenna for data communication; and
- a memory for storing the communicated data.

9. A data communication device according to claim 8, **characterised** in that the controller of the data communication device comprises:

- a serial to parallel converter for converting parallel mode information of the memory into serial mode used by the short-range data communication unit, and correspondingly the serial mode information into the parallel mode;
- a splitter for connecting a parallel mode write and read connection of the memory alternatively to the interface of the expansion memory location of the electronic device or to the serial to parallel converter for a short-range data communication link; and
- a microcontroller for controlling the serial to parallel converter and the splitter.

10. A data communication device according to claim 8, **characterised** in that the short-range data communication unit is a LPRF unit.

11. A data communication device according to claim 10, **characterised** in that it comprises means for supplying a busy signal to the electronic device when the memory is processed by the radio link, and a busy signal to the LPRF unit when the memory is processed by the electronic device.

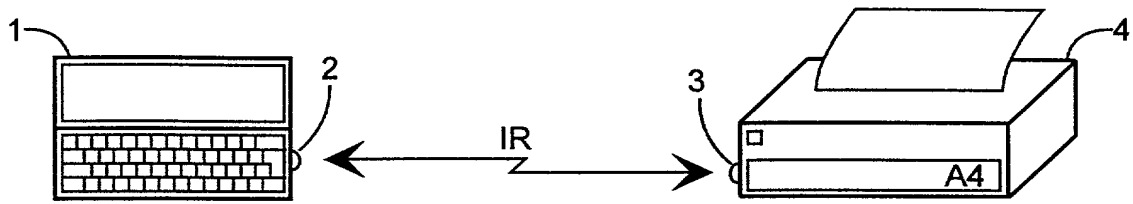
12. A data communication device according to claim 10, **characterised** in that it comprises means for giving to the microcontroller:

- an operation enable signal enabling the operation of the data communication device when the memory is processed by the electronic device, and
- a busy signal when the LPRF unit is occupied for data communication.

Abstract

The object of the invention is a particular memory card (8) mounted in a general purpose ATA expansion memory location (9) in a separate electronic device, such as a high-class digital camera (10), whereby the memory card contains a data communication feature for transmitting the memory contents to a mobile station (5). Expansion cards containing memory which can be written and read are called Compact Flash, in accordance with the Flash EEPROM memory contained in small-sized cards. The data communication is performed on a short-range radio frequency LPRF link. The memory card (8) is also applicable for instance in a personal digital PDA notebook, where the input data can be stored in an expansion memory. The duplex feature of the expansion memory enables the data to be transmitted at a radio frequency to a mobile station. The data communication features of the wireless device (5) are available for forwarding the data.

Figure 2



PRIOR ART

FIGURE 1

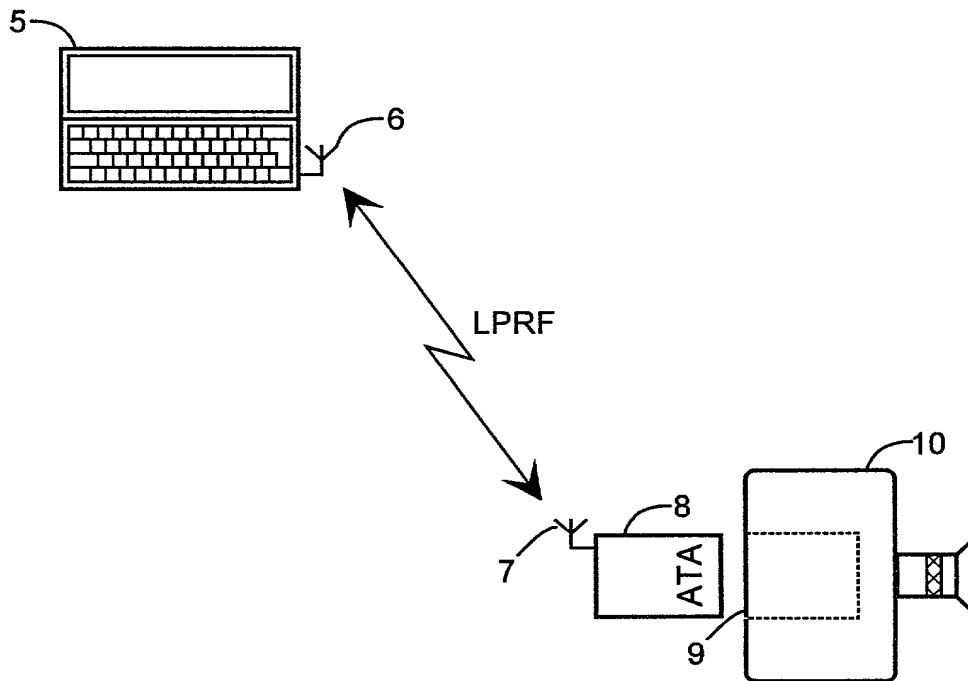


FIGURE 2

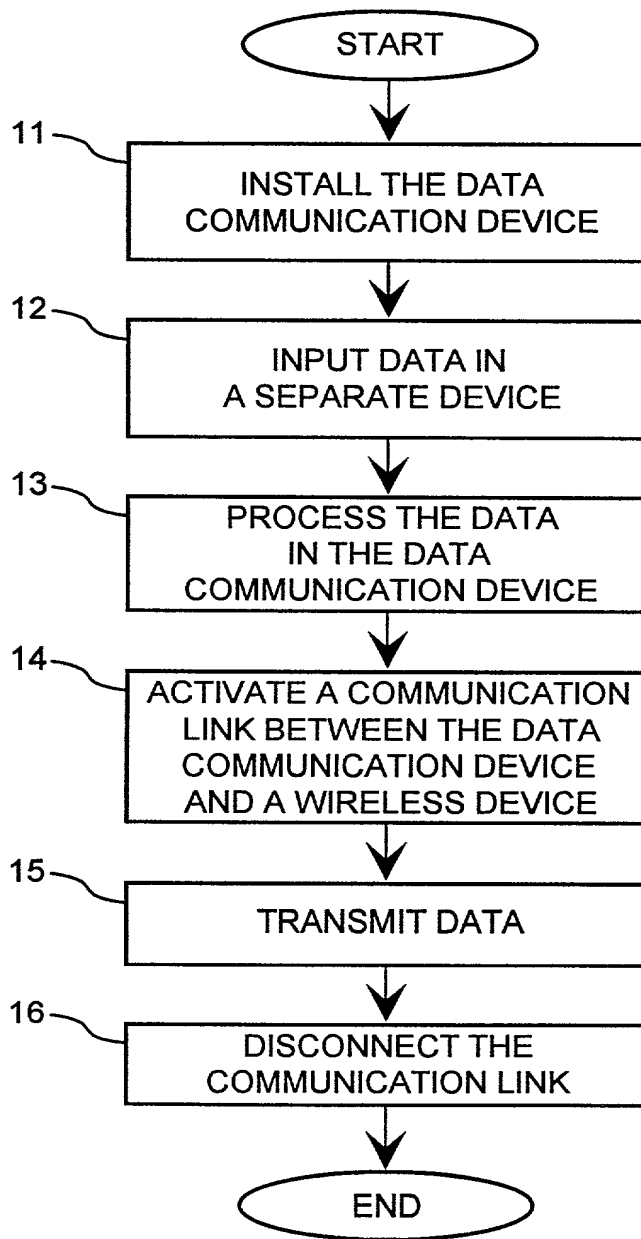


FIGURE 3

3/4

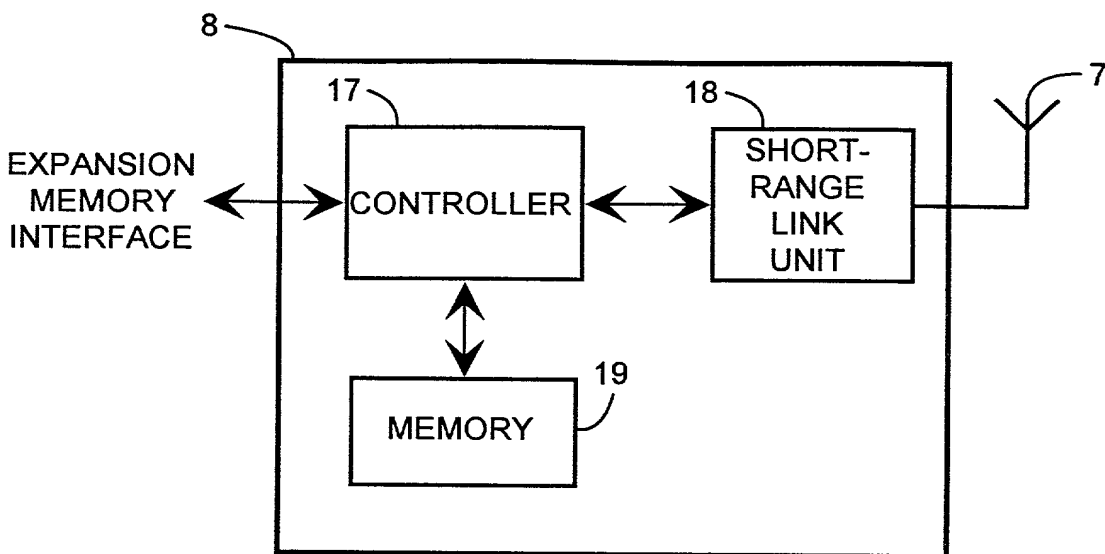


FIGURE 4

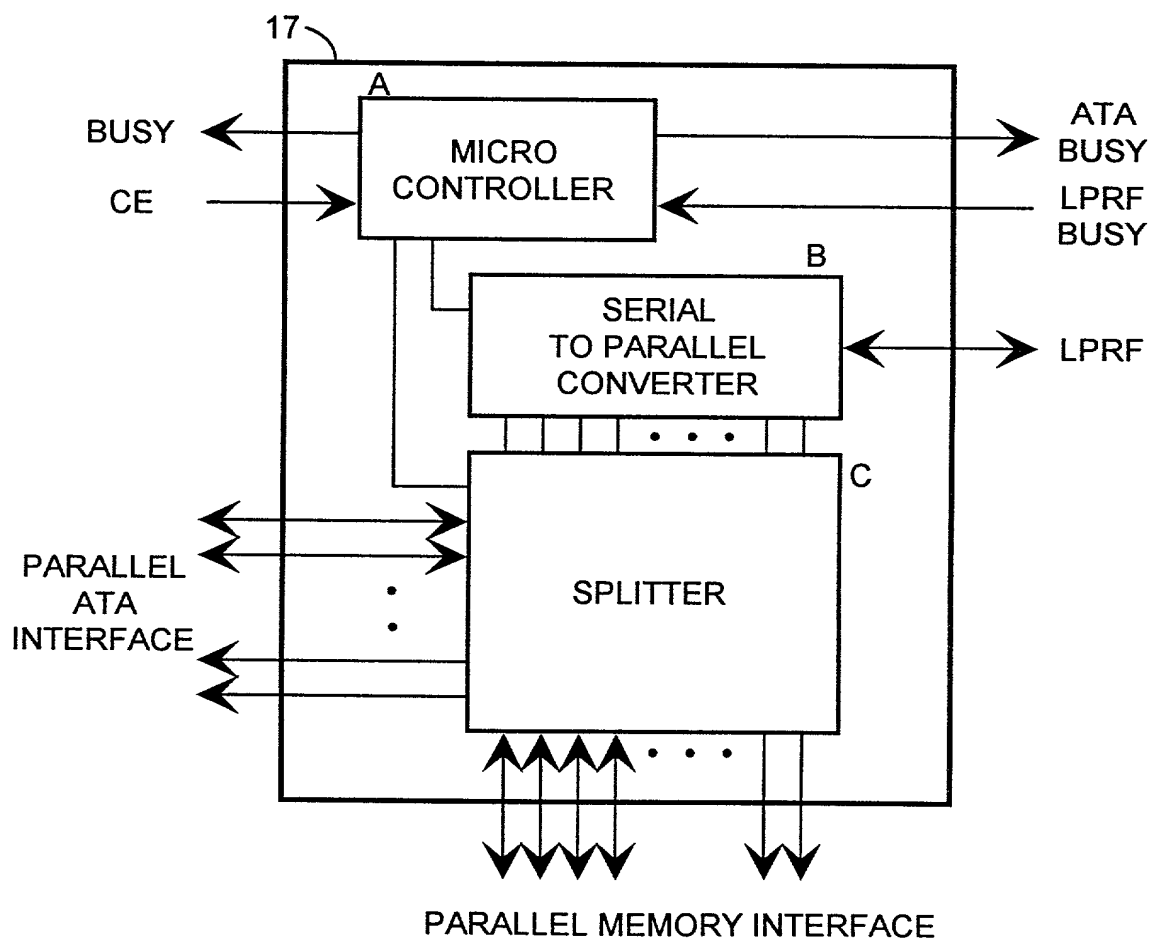


FIGURE 5

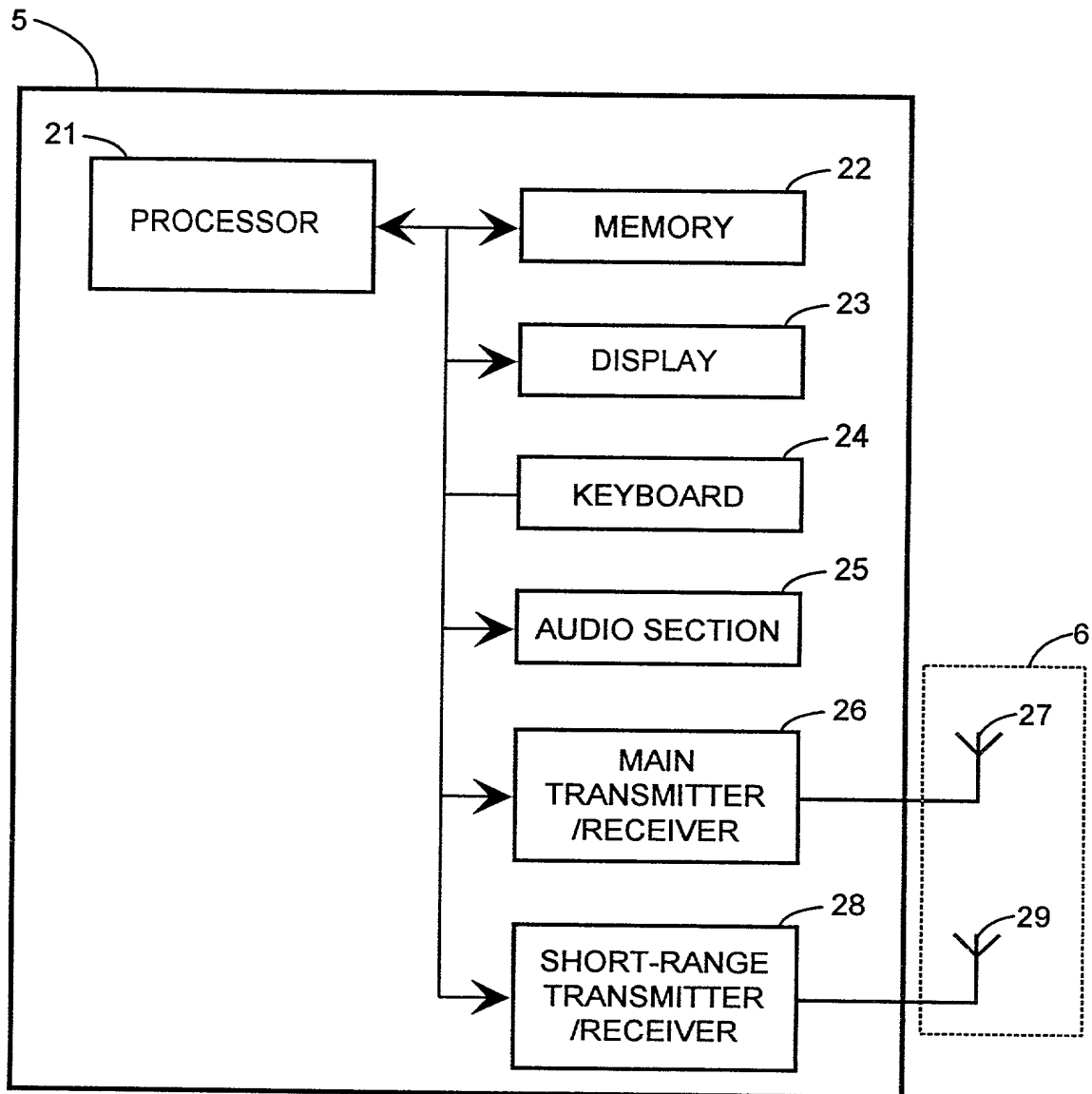


FIGURE 6

Attorney's Docket No. _____

PATENT

**COMBINED DECLARATION AND POWER OF ATTORNEY
(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL,
DIVISIONAL, CONTINUATION OR C-I-P)**

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

- ☒ original.
☐ design.
☐ supplemental.

NOTE: If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

- ☐ national stage of PCT.

NOTE: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.

- ☐ divisional.
☐ continuation.
☐ continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor (*if only one name is listed below*) or an original, first and joint inventor (*if plural names are listed below*) of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

**A method for data communication between a wireless device and an electronic device,
and a data communication device**

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b) or (c))

(a) ☒ is attached hereto.

(b) ___ was filed on _____, as ___ Serial No. 0 / _____
or ___ Express Mail No., as Serial No. not yet known _____
and was amended on _____ *(if applicable)*.

NOTE. Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

(c) ___ was described and claimed in PCT International Application No. _____, filed on _____ and as amended under PCT Article 19 on _____ *(if any)*.

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

☒ and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

___ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d) ☐ no such applications have been filed.

(e) ☒ such applications have been filed as follows.

NOTE. Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

COUNTRY(OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119	
Finland	982353	29 October 1998	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO
			<input type="checkbox"/> YES	<input type="checkbox"/> NO

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER

FILING DATE

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)
UNDER 35 U.S.C. 120**

— The claim for the benefit of any such applications are set forth in the attached
**ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY
FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN PART (C-I-P)
APPLICATION.**

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

NOTE. If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete **ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION** for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Clarence A. Green (24,622)

Harry F. Smith (32,493)

Mark F. Harrington (31,686)

(check the following item, if applicable)

— Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO DIRECT TELEPHONE CALLS TO:

(Name and telephone number)

Clarence A. Green Clarence A. Green

Perman & Green 203-259-1800

425 Post Road

Fairfield, Ct 06430

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

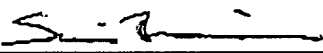
SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor:

Given name: Sami
Middle initial or name:
Family (or last name): INKINEN


Inventor's signature:


Date: 22.10.1999
Country of Citizenship: Finland
Residence: Hallituskatu 30 A 18, FIN-13100 HÄMEENLINNA, Finland
Post Office Address: Hallituskatu 30 A 18, FIN-13100 HÄMEENLINNA, Finland

Full name of second joint inventor, if any:

Given name: Sami Simo
Middle initial or name:
Family (or last name): VAPAAKOSKI

Inventor's signature:


Date: 18.10.1999
Country of Citizenship: Finland
Residence: Riihimäkeläkatu 21 B 4, 33530 Tampere, Finland
Post Office Address: Riihimäkeläkatu 21 B 4, 33530 Tampere, Finland

Full name of third joint inventor, if any:

Given name:
Middle initial or name:
Family (or last name):
Inventor's signature:
Date:
Country of Citizenship:
Residence:
Post Office Address:

*(check proper box(es) for any of the following added page(s)
that form a part of this declaration)*

☐ **Signature** for fourth and subsequent joint inventors. *Number of pages added* _____.

* * *

☐ **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. *Number of pages added* _____.

* * *

☐ **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. *Number of pages added* _____.

* * *

☐ **Added page for signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

* * *

☐ **Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.**
_____ *Number of pages added* _____

* * *

☐ **Authorization of attorney(s) to accept and follow instructions from representative.**

* * *

*(if no further pages form a part of this Declaration,
then end this Declaration with this page and check the following item)*
☒ **This declaration ends with this page.**